Varian SHS-40 Headspace Autosampler Control Driver User Guide

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Contents

Introduction....3
Installation and Configuration....3
Building a Method....5
Setting the Run-Time....6
Remarks about SHS-40 methods and CompassCDS methods....7
Using the Acquisition – Rack parameter and vial number....7
Building a Sequence Method....7
Working with CompassCDS Version 4.0....7
Starting and viewing an acquisition....9
Handling Missing Vials....11

Introduction

This document describes the installation and configuration of the Varian SHS-40 Headspace Autosampler Control Driver for CompassCDS.

It also explains how to build a control method or a sequence for this SHS-40, how to start and view a running acquisition.

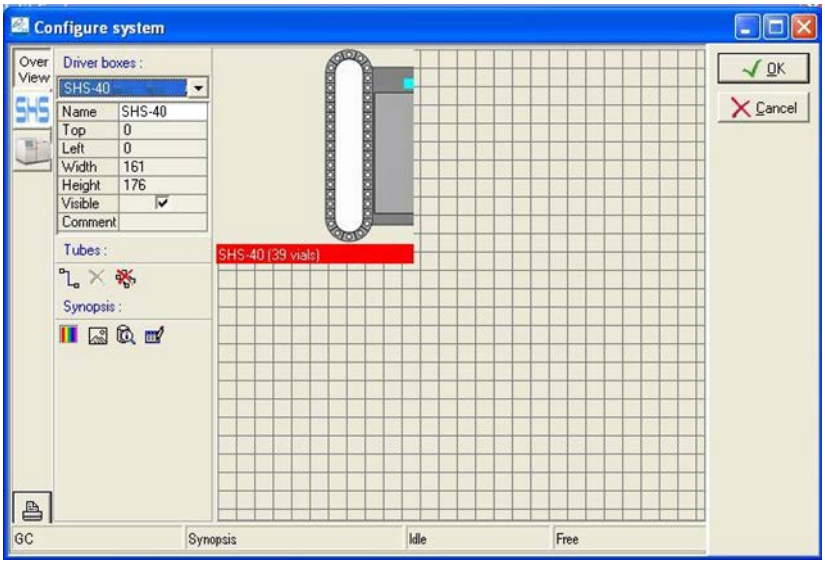
Installation and Configuration

The installation of the SHS-40 must be fully completed (see Installation Manual BR501547) with focus on the chapter “connecting to the data-system”.

The CompassCDS software must be installed (refer to the CompassCDS User Guide) before installing the SHS-40 driver software.

- Install the SHS-40 Driver software using the link (Install SHS-40 CompassCDS Driver).
- The SHS-40 drivers are now added to CompassCDS and can be used in the CompassCDS system.

To configure the SHS-40 in the CompassCDS Configuration Manager, click the right mouse-button on the desired system and choose ‘edit’.



There is one setting to configure the SHS-40:

- Choose the COM-Port to which the device is connected.

Figure 1 Configure the SHS-40

Building a Method

The following parameters must be entered in a method for the SHS-40:

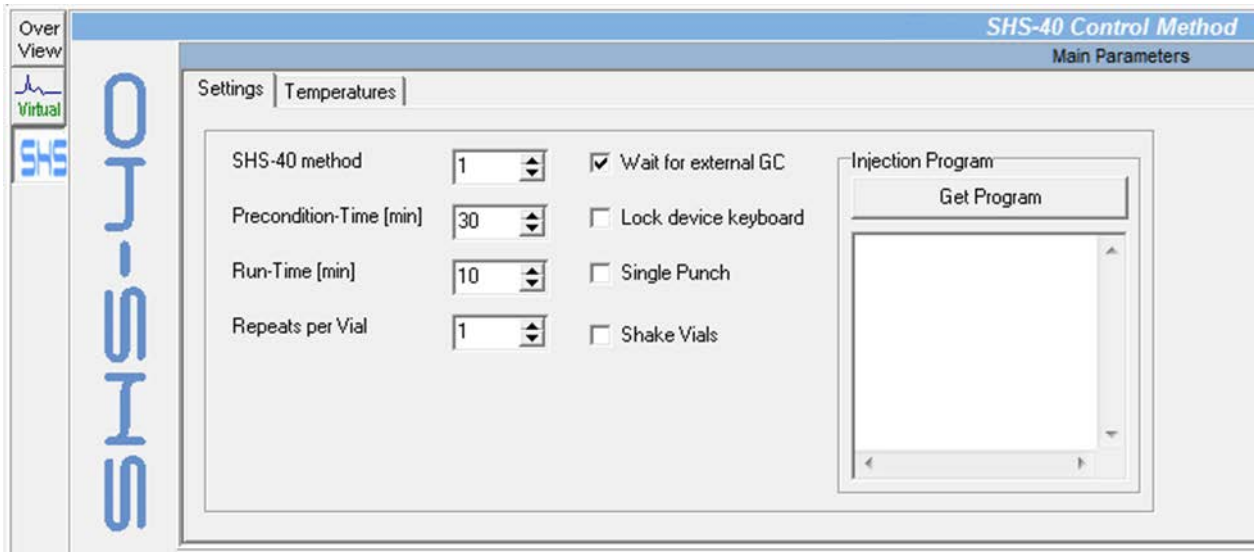


Figure 2 Method Parameters Settings tab

Parameters of the Settings tab:

Parameter	Range	Default	Description
SHS-40 method	1..9	1	Method to execute on the SHS-40. These methods can differ in the injection programs they execute.
Precondition-Time	1..300 min	30	Time to precondition the vial in the oven.
Run-Time	1..99 min	10	Run-Time of the analysis, see later remarks for setting the Run-Time.
Repeats per vial	1..9	1	Number of injections per vial.
Wait for extern GC	Yes/No	Yes	Wait for ready-signal of GC before injecting. Should always be enabled.
Lock device keyboard	Yes/No	No	Prohibit use of device keyboard during acquisition.
Single punch	Yes/No	No	If single punch is enabled, needle will penetrate the sample only once.
Shake vials	Yes/No	No	Shake vials

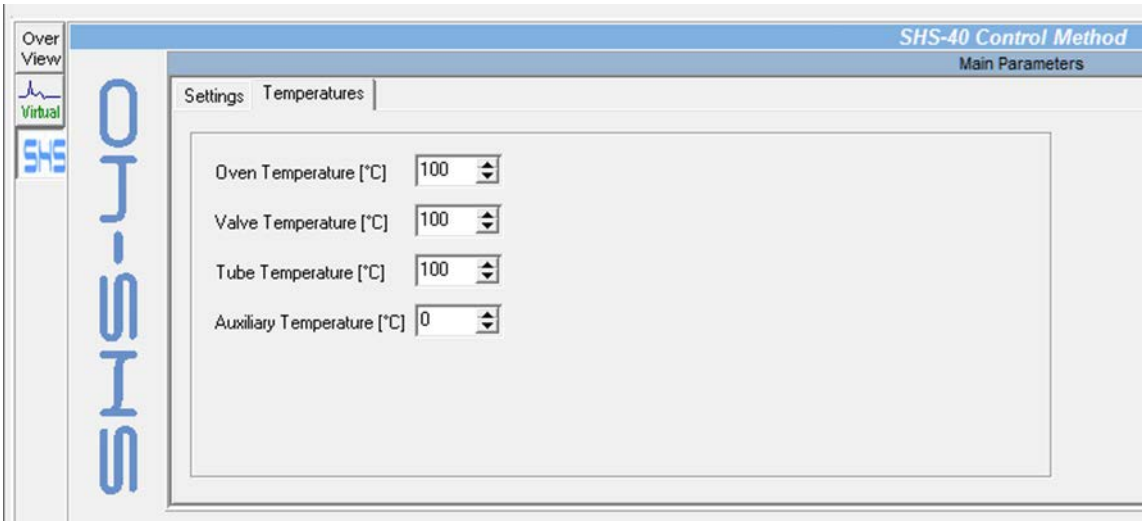


Figure 3 Method Parameters Temperatures tab

Parameters of the Temperatures tab:

Parameter	Range	Default
Oven temperature	0..200 °C	100
Valve temperature	0..200 °C	100
Tube temperature	40..200 °C	100
Auxiliary temperature	0..200 °C	0

Setting the Run-Time

Check the Run-Time entered in the GC, before setting the SHS-40 Run-Time parameter.

To let the SHS-40 work correctly you have to calculate the Run-Time for the SHS-40 as follows:

- Run time SHS-40 = 2 x GC Stabilization Time + GC-Oven program Time + 1 min System Ready Time + Oven cool down time

Before and after the GC data-acquisition, the GC stabilizes its temperatures for the entered stabilization time.

The System Ready Time is needed for safety reasons. This additional time ensures that the GC is waiting for injection (ready) when the SHS-40 starts the injection. Unfortunately it is possible that the GC sends a Ready-Signal when CompassCDS is in the Idle state. When the SHS-40 is waiting for injection, it will start injection, although CompassCDS is not in the Waiting-For-Injection phase.

The acquisition time entered in the method or a sequence for all devices is neglected when the system includes a Scion Instruments GC.

The described behavior may be different with gas chromatographs other than the Scion Instruments GC.

Remarks about SHS-40 methods and CompassCDS methods

In general, a CompassCDS method analyzes one sample at a time.

If more than one sample will be analyzed, this needs to be done with a sequence in CompassCDS.

To execute a SHS-40 method, you need to generate a CompassCDS sequence with one sample for every sample in the SHS-40 method. You will get one chromatogram for each analyzed sample.

The SHS-40 is started once and works without further instructions.

Using the Acquisition – Rack parameter and vial number

As already mentioned, the SHS-40 gets the instructions once and then works without further commands. These instructions have to be sent in the first sample of a sequence.

NOTE: The rack parameter of the acquisition settings or the rack parameter of the sequence needs to be modified in order to correctly instruct SHS-40 on how many samples (runs) are planned for a method. Therefore, set the acquisition rack parameter to '5' when analyzing five samples.

Set the rack parameter of the first sample in the sequence to the sample number and for all other samples of the same method to ‘0’ If you have a sequence consisting of samples from different methods, you need to set the rack parameter to the number of samples for the same method for every first sample of each method.

Building a Sequence Method

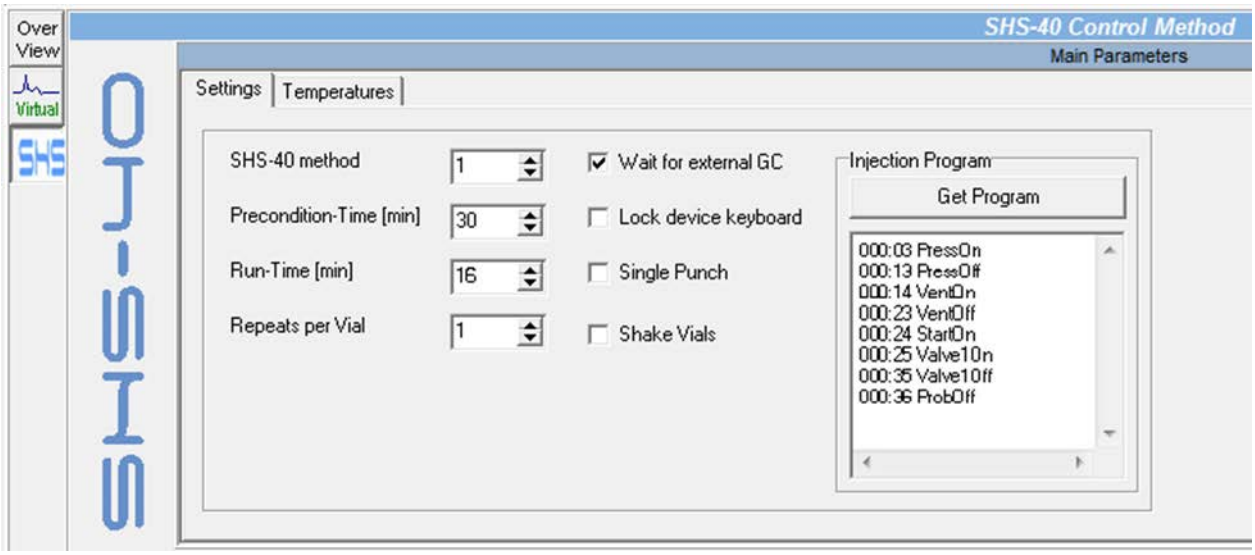
Working with CompassCDS Version 4.0

- Open a sequence and enter the desired Method (here STD_4a.METH)
- Description: Fill in the sample name.
- Vial: Fill in the corresponding SHS-40 vial position at the SHS-40 tray.
- Enter 5 at Rack# to analyze 5 samples at the first series.
- Fill in all five lines with correct data.

It is possible to program direct a second series, for example, with a different Method or with additional samples.

In the above example we add 3 samples and start with Position 6. All SHS-40 parameters are present in the method:

In the Control Method under “Control” and “SHS-40” are two tabs: Settings and Temperatures.

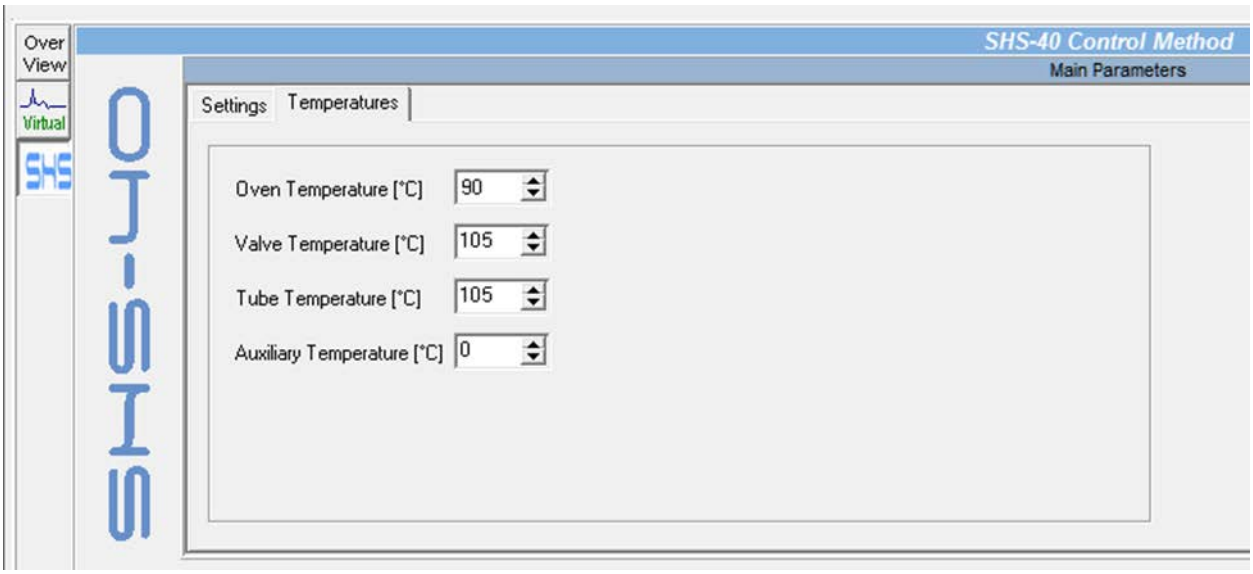


Please note that the “Run-Time” for the SHS-40 is the time which the GC needs for the GC run AND for cooling down (including equilibration time).

The “Precondition- Time” is the time which the SHS vial is headed up before the injection program started. The Precondition-Time is automatically calculated when a sample is placed in the oven (maximum 12 samples).

It is possible that there could be vials in the oven before the first GC run has been started (e.g., PC time 60 minutes; GC time 20 minutes).

Usually the temperatures of the valve and the tube must be higher than those set for the oven (remember the safety information for the oven temperature).



The oven temperature must be below 90 °C when water is present in the sample. Water in the vial will decrease the sensitivity of other components.

If the parameter Repeat per vial is greater than one, you have to multiply the samples in the sequence by the value of Repeats. If in the example the parameter Repeats was 2 for the first method, you should have entered 10 samples for this method.

The parameters Run time, No. of Injections, and Injection Volume of a CompassCDS sequence are not used by the SHS-40.

Starting and viewing an acquisition

In the SHS-40 status display, Method Settings tab, (see Figure 4) the parameters of the currently executed method are visible.

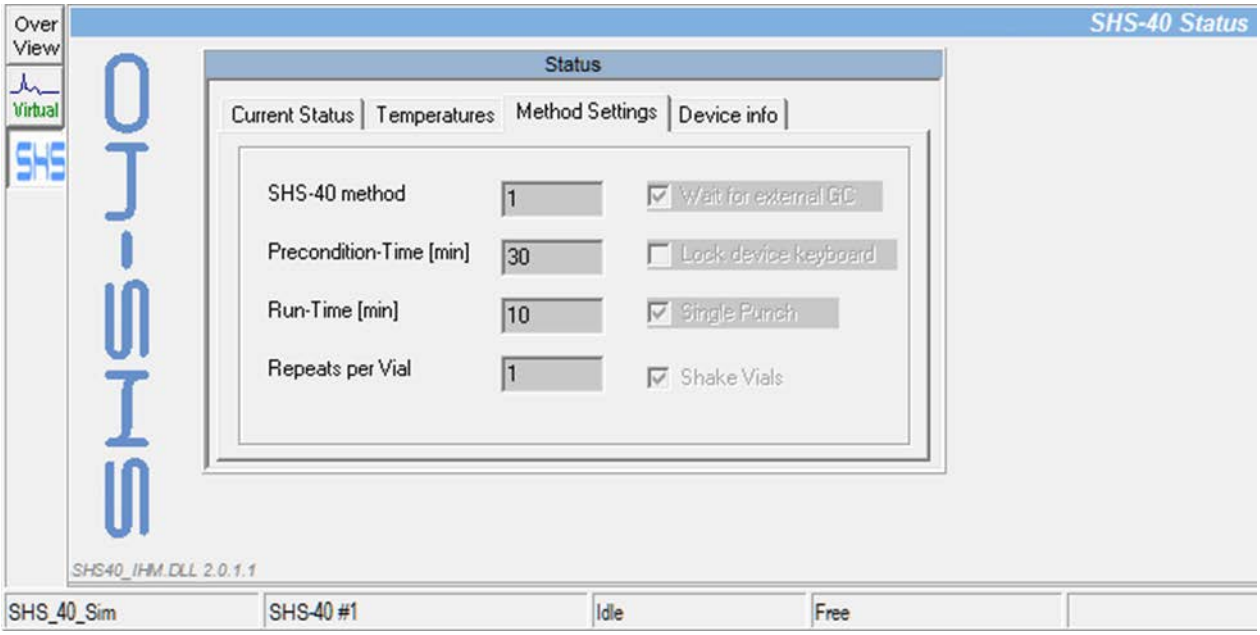


Figure 4 Status display of the SHS-40 during acquisition, Method Settings tab

The (Actual value) temperatures in the Temperatures tab are updated every 10 seconds from the SHS-40 (see Figure 5).

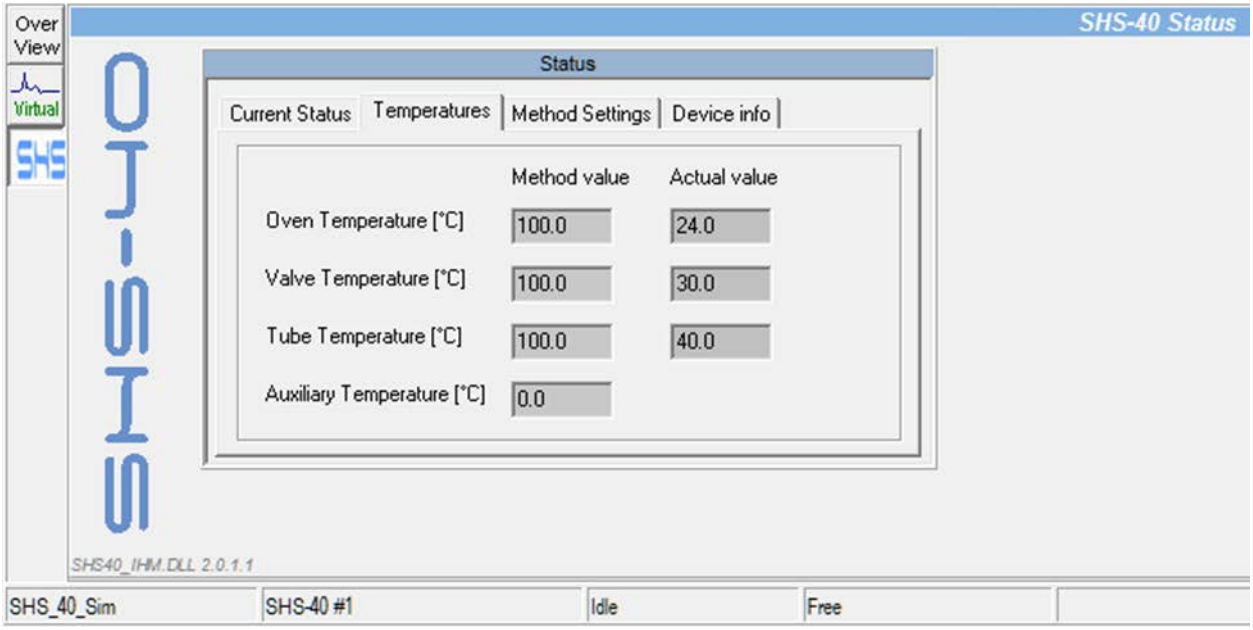


Figure 5 Status display of the SHS-40 during acquisition, Temperatures tab

The Current Status tab (Figure 6) shows two status lines (updated every 10 seconds) and the current stop vial.

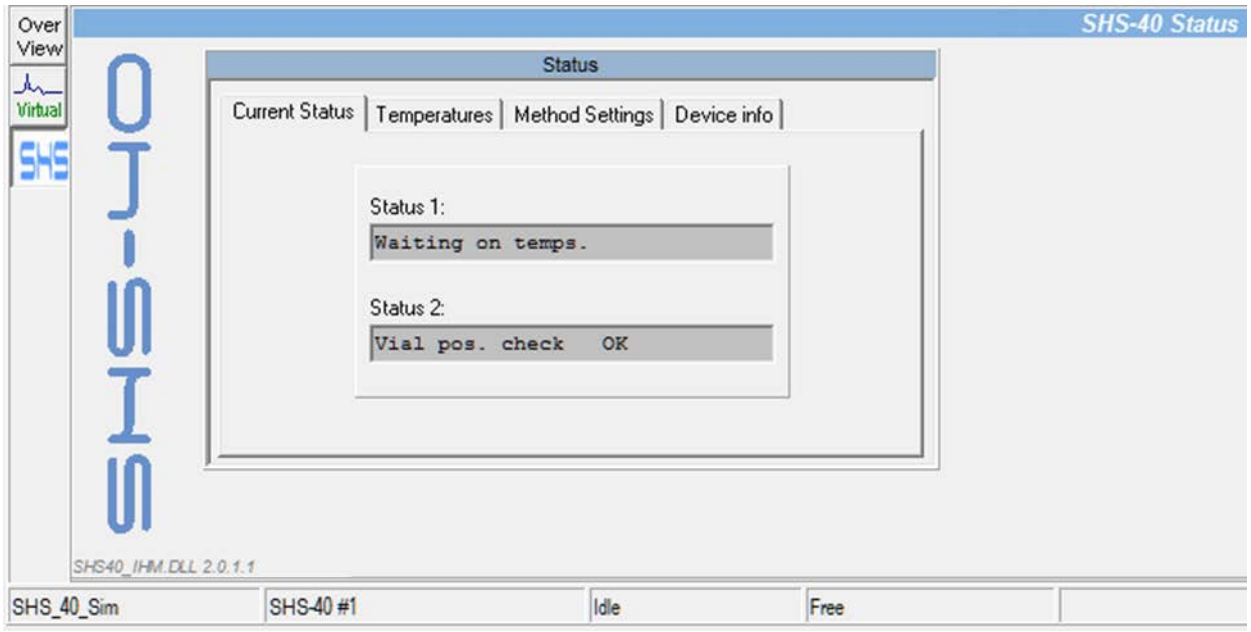


Figure 6 Status display of the SHS-40 during acquisition, Current Status tab

The Device info tab shows information about the attached device (see Figure 7).

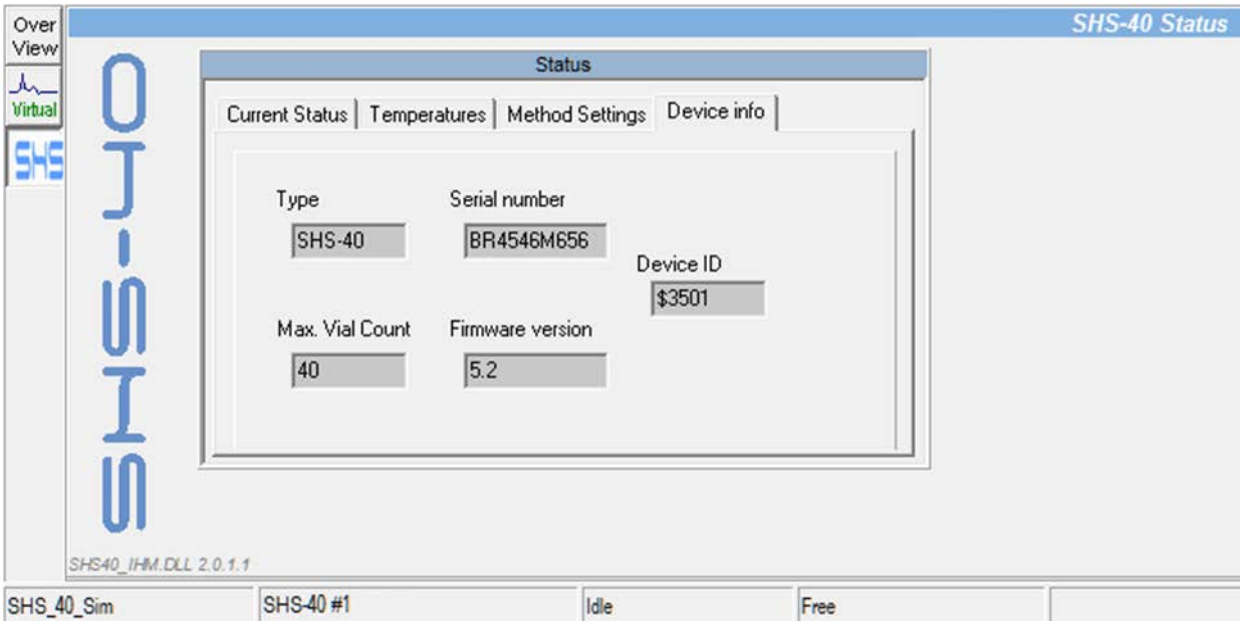


Figure 7 Status display of the SHS-40 during acquisition, Device info tab

Handling Missing Vials

The SHS-40 can recognize missing vials when trying to inject them.

Although a vial is missing, the SHS-40 sends an injection signal so that the CompassCDS sequence is not missing a sample.

The result of a missing vial is an empty chromatogram in the sequence. All other samples should have been analyzed correctly.

If a vial is missing or a vial was damaged during injection, the corresponding error message is written to the Run Log, which is part of a chromatogram-file.

Open the chromatogram, click the method section and view the acquisition parameters. On this dialog press the Run Log button and the Run Log will be displayed (see Figure 8).

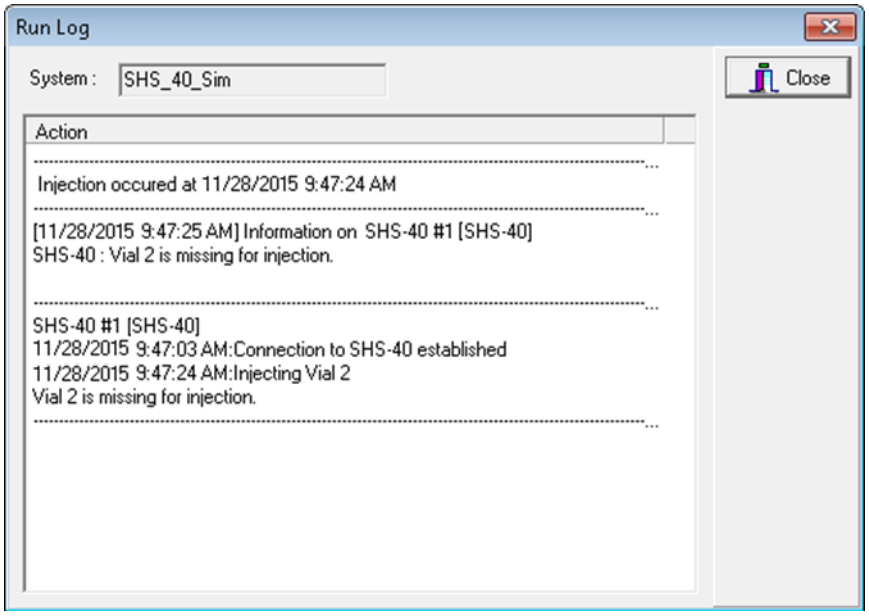

Run Log
System :
SHS_40_Sim
Close
Action
Injection occured at 11/28/2015 9:47:24 AM
[11/28/2015 9:47:25 AM] Information on SHS-40 #1 [SHS-40]
SHS-40 : Vial 2 is missing for injection.
SHS-40 #1 [SHS-40]
11/28/2015 9:47:03 AM:Connection to SHS-40 established
11/28/2015 9:47:24 AM:Injecting Vial 2
Vial 2 is missing for injection.

Figure 8 ***Opening the Run Log of a chromatogram file***